King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math 102 (162) Sec 35 - Quiz 3

Name: ID: Serial No.:

1. Find the average value of the function $f(x) = x^2 \ln x$ on the interval $[1, 3]$.

2. Find all numbers b such that the average value of $f(x) = \sqrt{x}$ on the interval $[0, b]$ is 6.

3. Using the method of cylindrical shells, set up, but do not evaluate, an integral for the volume of the solid obtained by rotating

   (a) the region bounded by the curves $y = x - x^2$ and $y = 0$ about the line $x = -1$.

   (b) the region bounded by the curves $y = \ln x$, $y = 0$ and $x = 2$ about the x-axis.

4. Find $\int_0^{2\pi} t^2 \sin 2t \, dt$

5. First make a substitution and then use intergration by parts to evaluate the integral $\int \cos \sqrt{x}\, dx$.